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Meeting Pluralist Demands With a Pluralist Response. *The Omnium Project*: Offering an Online Collaborative Design Response to an Increasingly Diversified, Interconnected and Pluralist World.

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Design education and design practice ideally co-exist, receptively supporting each other in the preservation of quality and innovative progression of the broader discipline. However, within the current context of increased global interconnectivity and multiplicity in ideas, cultures and practices, one can question whether a diversification and complication of the role of the contemporary designer has occurred. If so, are the impacts of such complexities placing new pressure on the intended cycle of support between education and practice?

Arguably, the cycle of support is indeed seen as being strained – with educators and practitioners reviewing the interrelation of the design community, making adjustments and alterations to accommodate perceived problems and emerging needs. However, most reviews relating to design education often appear to neglect opinions of those referred to as the primary beneficiaries: the people most affected by the evolving state of such an interdependent cycle – design students. Surely, their views and comments should be observed more closely and seriously analysed in order to gain better insights for suggesting how to maintain an interdependence that is crucial to the welfare of the design discipline.

It has been suggested that a fundamental question facing design education today is: how the quality of education and practice can be improved to provide interrelated life-affirming models for understanding and improving the world at large? By listening to the views and needs of those who will determine the discipline's progression and integrity in years to come, perhaps this vision can be realised. By making the design community aware of concerns raised by design students and giving examples of ways that they can be alleviated, the cycle of support between education and practice can be ultimately maintained.

Throughout our research it is apparent that contemporary society's more pluralist demands are increasingly being answered by pluralist design responses. Design practice has become far more collaborative within and across disciplines in an attempt to accommodate changing needs. In line with practice, design education claims to have recognised a need to also move in this direction, in order to prepare students for practice and to continue the development of the profession. However, when surveyed, design students revealed that they still feel pressure to perform individually in competition with others, rather than as an individual in collaboration; their assessment tasks predominantly encourage individuality over group projects; and they are rarely given the opportunity to collaborate with students across other design disciplines within their education.

This paper examines the current cyclical relationship between design education and design practice by sampling and interpreting the collective view of close to 550 Australian design students from a selection of tertiary institutions in Sydney. Recognising student opinions, the paper aims to deliver an example of how design education has responded to these problems. A case study of a new online educational framework – *The Omnium Project*, includes accounts of experimental design projects trailed to date and describes suggested ways of providing a more holistic learning culture that encourages exploration intellectually, collaboratively, pedagogically and practically.



MEETING PLURALIST DEMANDS WITH A PLURALIST RESPONSE

The Omnium Project: offering an Online Collaborative Design response to an increasingly diversified, interconnected and pluralist world.

INTRODUCTION

This paper examines the current relationship between contemporary design education and design practice within a constant state of multi-faceted change. It discusses changing demands for design education and practice, from a more global society. Within 'a world of increased interconnectivity and multiplicity in ideas, cultures and practices' (Warwicker 1999), it observes strategies suggested by theorists, educators and practitioners to accommodate social change within the two contexts.

By seeking and describing the opinions of 549 Australian design students on the implementation of suggested strategies to accommodate change, the paper proceeds to describe an example of one online design education initiative that has attempted to address responses and concerns. *The Omnium Project* has instigated an alternative educational *framework* through a series of online collaborative design ventures and experiments; arguably providing a more flexible, holistic and responsive learning culture for creative disciplines. It encourages collaborative exploration; intellectually, creatively and practically by using new technologies associated with the Internet.

PART ONE:

Design demands of a global society with increasingly pluralist needs.

Design education and design practice ideally co-exist as a greater whole: receptively supporting each other in the 'preservation of quality and innovative progression of the broader discipline' (Newman 1996; Stephens 1996; Webb 1997; Wild 1996). However, within a current global context of 'increased interconnectivity and multiplicity in ideas, cultures and practices' (Warwicker 1999), it can be questioned whether a diversification and complication of the role of the contemporary designer has occurred. Are the impacts of such complexities being recognised within both design education *and* practice? If not, is a new pressure being placed on two distinct, yet interdependent areas of design?

Through ever-evolving technological communication networks; the development of increasingly globalised economies; and a worldwide growth in multicultural societies; access has been granted to a diversity of choices in the way we go about living our lives. 'Knowledge is less defined. Existence is less objective. Answers aren't always right or wrong: they are more or less appropriate' (Bassett 1996). Value is now placed on the 'importance of multiple perspectives, pluralism and indeterminacy' (Danvers 2003). We are continually developing new interconnections of actions, information and beliefs, adding to the complexity of our world.

According to theorist and design practitioner, John Warwicker, we now exist in a time where 'change is the only constant'. There is a changed 'sense of the individual', an increased ease in interaction – 'the value of individuality is now seen within a collaborative context' (1999, p. 39). Described by Jerzy Wojtowicz (1995) as a 'retribalizing of the world',

increased access to different ideas and abilities characterises the way we now live our lives.

Taking this into consideration, perhaps, in our present culture, one designer [singular] cannot always accommodate for everything that is required [plural]. However, it has been found that extended expectations [plural] can be met by combining the efforts of many designers [plural].

PART TWO:

A pluralist design response (professional and educational)

By researching contemporary design practice, it often appears that society's increasingly pluralist and changing demands are progressively being answered with pluralist design responses. We can observe design practice becoming more collective¹ within and across disciplines, in 'an attempt to accommodate society's changing needs' (Holt 2000) in 'both commercial and experimental projects' (Sclater 2001).

Of course, design history and theory reveal that collaborative design processes are by no means new approaches. Many design projects, particularly in industrial, engineering and architectural design, claim to have engaged in collaborative activity for decades and even centuries. However, one could contest that many of these examples are not true collaborative design processes at all, but merely an assembly of completed components already having undergone their own process, using localised and traditional face-to-face methods.

With new demands arising from an increasingly interconnected and pluralist culture, design practice has had to evolve to accommodate a broad expanse of responsibilities. By defining these evolutions, starting points for new educational approaches and methodologies can be established. Through a cyclical relationship, within the broader discipline, together students and practitioners should support each other to promote a 'seamless progression of the field' (Bryce 1996): one that is considerate of the 'contemporary and future needs of society' (Newman 1996).

Identifying pluralist characteristics of practice within contemporary design professions

Through extensive examination of many collaborative design processes evident within current professional practice, together with collated observations from a variety of academic papers presented at recent design and education conferences, a set of 'pluralist characteristics of practice' that appear to have evolved can be identified.

The *pluralist characteristics of practice* include:

¹ A collective environment allows for intelligent practice in which individuals can further their ideas and abilities through discussion and cooperation. It is an amalgamation of varying perspectives to more accurately address the varying dimensions of contemporary design briefs. Michael Spiccia, former member of international new media agency The Attik, describes pluralistic modes of working collectively as though one has been infected by a *creative virus* – new trains of thought, experimentations with media, and a greater drive to improve and grow as a designer contracted from the responsive environment of collaborating individuals. (in Ionescu 2003).

- an internalisation of the capabilities of technology to be used not only for production purposes, but also to facilitate communication between designers and disciplines (Thompson 2003);²
- a willingness to let go of individual ownership of ideas and egotistical reverence in favour of multiple perspectives and a more holistic approach to the brief (Glesta 1997);³
- the generation and amalgamation of multiple perspectives through intense group brainstorming (Warwicker 1996; Helfand 1999; Neumeier 1999; Danvers 2003; Lupton 2003);⁴
- the flattening of work structures into non-hierarchical domains where each member is valued equally for their contribution to the practice (Withers 1991; Holt 2000; Polaine 2003);⁵
- an extended focus on the needs of projects, compiling varying teams of designers to accommodate for specific requirements in the fulfilment of a greater cause, rather than sufficing with segregated or generic, pre-determined work structures (Cami 1991).⁶

Design Education's response to pluralistic practice and characteristics

In a time of 'liquidity, saturation and overflow' (Lupton 2000) the same question of how to be anything and everything that challenges the members of design practice, transmutes to the preparatory grounds of design education. To preserve the idea of a 'cycle of support', design education claims to have recognised 'a need to move along parallel paths' (Bryce 1996). By adapting the collective and integrative methods of practice into modes of learning (Buchanan in Niederhelfman 2001), outcomes more suitable for our current age and the future are thought to result (Danvers 2003). Such pedagogical evolutions described in design curricula and recent design education conferences⁷ promote:

- education as a speculative ground for experimentation;
- the favouring of collective brainstorming and group work;
- the integration of influential external factors;
- the understanding of design across disciplines; and
- the provision of a life-long learning culture.

² Examples of this use of technology as a common platform (Poynor 1994) can be seen in the work of the self-proclaimed *conversation* (Warwicker n.d.) that is British a-disciplinary collective/company *Tomato*; the collaboration between *Tonkin Architects* and *Hybrid Graphic Design* of Hong Kong also displays this sensibility when designing the seamlessly integrated graphics and interiors of the *Broadway Chain* of cinemas (Dean 2000).

³ As seen in the online experiment, RMX, conducted by Australian graphic design company Rinzen. Based on the premise of the game 'Chinese Whispers', participating graphic designers were encouraged to release their designs for someone else to toy with and pass on to the next person for adaptation and evolution (Rinzen n.d.).

⁴ Commonly known as think-tanks, practised frequently by San Franciscan annual report design giants – Cahan & Assoc. (Helfand 1999). This notion has been further extended by US based company IDEO who engage in 'bodystorming' sessions as part of their product design process (www.ideo.com).

⁵ Such as in New York based collective, Graphic Havoc, which operates without a creative director, instead spreading the ownership equally across its five members (ed. Burton 2003).

⁶ Illustrated by the massive orchestration of the design of Melbourne's Federation Square (Davidson in Biles 2002). Unifying many different practices and ideas, pooling the input of architects, engineers, landscapers, graphic designers, lighting specialists and numerous public artists, it could be said that the true notion of federation was explored.

⁷ - The DIA National Conference on Design Education (University of South Australia, 1996)
 - Emergent Paradigms in Design Education: Sustainability, Collaboration & Community (Faculty of the Built Environment University of New South Wales, 1997)
 - Re-Inventing Design Education in the University (Curtin University of Technology School of Design, 2000)

PART THREE:

Testing suggested and new pedagogical evolutions

Although these revisions claim to be making a positive influence in the development of young designers, without testing their effectiveness, the changes remain only ideas and not confirmed movements forward. Throughout our research we observed that experience and opinion of education's 'only direct, daily observers' (Seldin 1980, p.36), design students, were largely under-represented. In her review of Re-inventing Design Education in the University Conference 2000, Melissa Niederhelman pre-empts this observation, labelling it a massive oversight and declaring students to be the 'best gauge for what is working and what isn't' (2001, p. 86).

In 2003, through distribution of a questionnaire to 549 design students across Sydney, the authors of this paper sought experiences and opinions regarding evidence and effectiveness of pedagogical change. The survey responded to Swann's claim that 'the student is the primary beneficiary of the educational experience' (1996 p. 28), and Miller-Smith's call at the 1996 DIA conference for a 'need to connect with student aspirations' (in Luekenhausen p. 141). The sample included; respondents from 5 design institutions, including a private college, TAFE and universities; represented six study years; and a variety of curricula including architecture, multi-disciplinary, industrial, interior, fashion and graphic design. When analysed in relation to the demands of contemporary culture and practice, proposed improvement and direction for current and future development in design education became apparent.

Despite claims of revision, when surveyed the sample revealed that despite there being a strong emphasis placed on;

- the importance of speculation and experimentation;
- collective brainstorming; and
- provision of a life-long learning culture;

key factors of integration and collaboration, reflective of society and practice, failed to be implemented effectively into design education curricula. The students reported that they:

- they still felt pressured to perform *individually in competition with others*, rather than as *individuals in collaboration* (Fig. 1);
- they continued to be encouraged to work individually on projects, instead of within groups (Fig. 2); and
- were rarely given the opportunity to collaborate within their education with students across other design disciplines (Fig. 3).

Examining the results of the 2003 survey of 549 design students in Sydney

Pressure to perform individually in competition

The majority of students surveyed felt that a greater emphasis was placed on singular competitive achievement, as opposed to working effectively in collaboration with others. Perhaps most alarming was the response of those closest to transitioning into the profession, with over 60 percent affirming this opinion (Fig. 1).

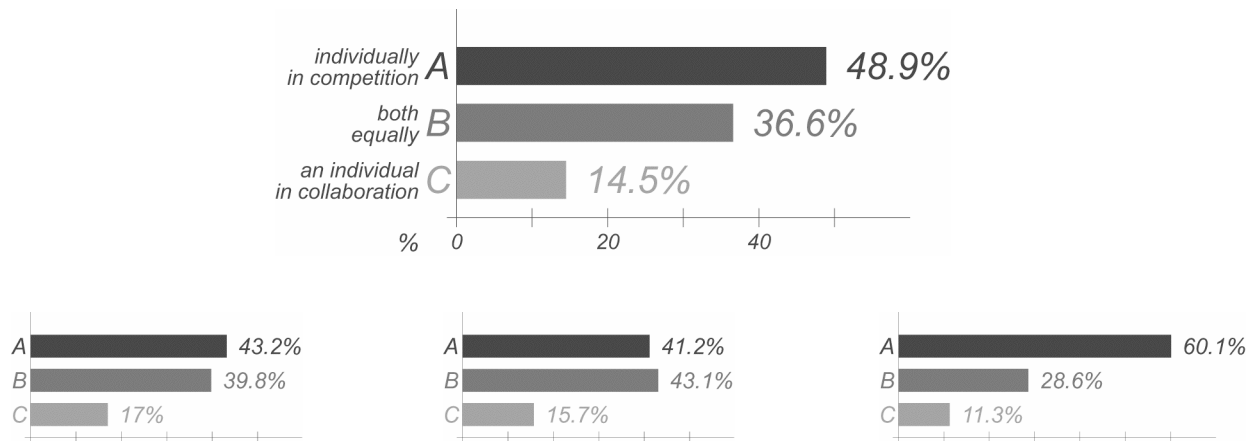


Figure 1: Student responses to the emphasis placed on performing individually in competition with others, compared to an individual in collaboration with others. Results are subdivided into responses from 1st, 2nd and 3rd-6th years.

Not only are these results in contradiction to projected aims of contemporary design education, they also provide inadequate reflection of the movements of practice in which Warwicker describes a ‘changed sense of the individual’ (1999). Designers are now often valued for how they contribute to a greater whole – ‘rather than being a sole creative genius, a sense of altruism is the favoured attribute’ (Polaine 2003).

Resistance within curricula towards encouraging group work

In contradiction to emphasis placed on individual success, a significant number of students recognised the benefits of being able to work *both* singularly and pluralistically in response to a brief. However, simplicity of working alone was declared a favoured approach (Fig. 2).

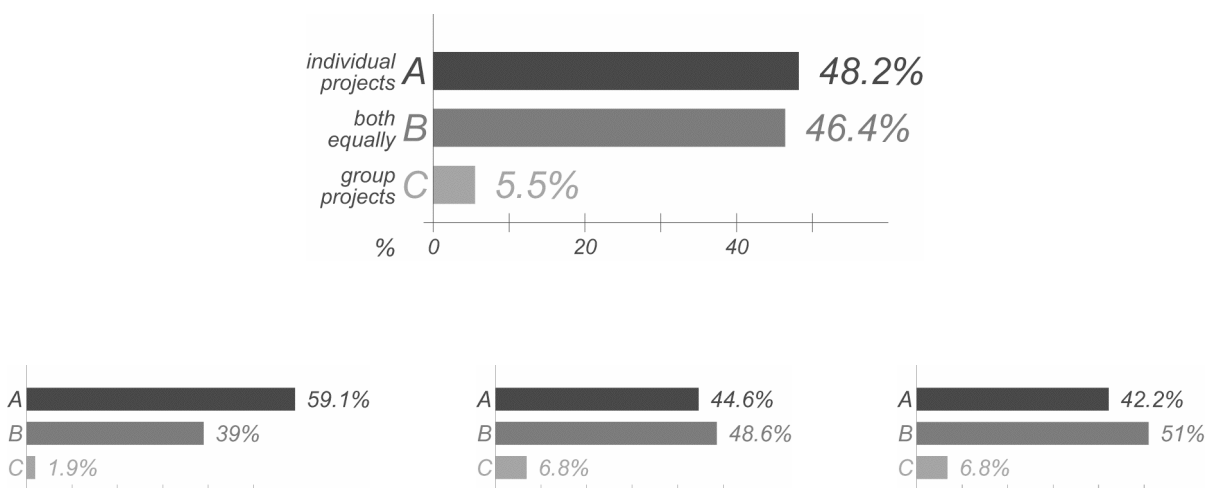


Figure 2: Student preference to work on practical assignments in groups or individually. Results are subdivided into responses from 1st, 2nd and 3rd-6th years.

The main concerns students raised in regards to working in a group were primarily related to time. With their busy schedules the respondents wished to work when it suited them,

and not be restricted by the timetables of others. Displaying a lack of regard for the actions of contemporary design practice, many of the students who responded were uncomfortable with having to: compromise; please others; be open to criticism; and having to justify their work. They didn't want to open themselves up to the ideas of others, instead wanting the freedom to only please themselves: feeling more in control of the marks they would receive.

Isolation between design disciplines

Since collaboration seemed an unwelcome practice within isolated disciplines, when asked how frequently students were given the opportunity to collaborate across *different* design disciplines, accordingly, the majority of responses fell in the *hardly ever* to *never* categories. Breaking the results down into years, perhaps the most disconcerting response is from those who have experienced their education for the longest - 36 percent claiming they *hardly ever* collaborated across disciplines and over 40 percent quoting *never* (Fig. 3).

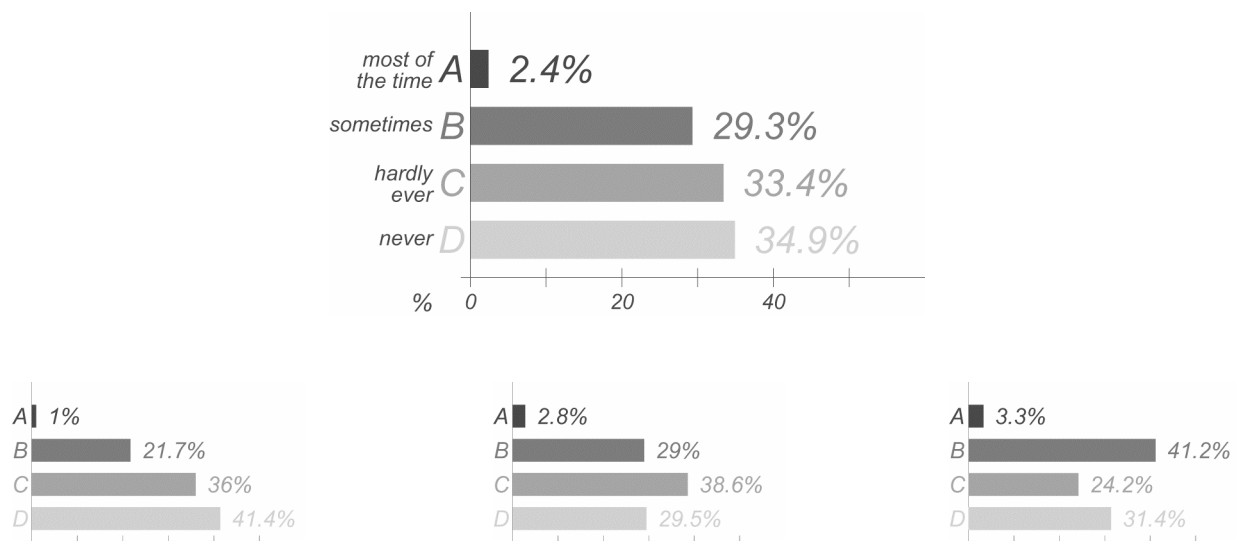


Figure 3: Frequency that students are given the opportunity to collaborate with those from different disciplines
Results are subdivided into responses from 1st, 2nd and 3rd-6th years.

At the DIA conference 1996, it was stated that 'good design deals with wholes. It is based upon our ability to see and express wholes' (Stephens 1996, p. 45). Do graphics not exist in relation to objects? Are objects not found within interiors? Do interiors not exist within architectural structures? And does architecture not exist within an environment?

PART FOUR:

Demanding a response to problems still apparent in Design Education

Once filtered through to design education – 'the essence of the art' (Mori in Szenasy 2003), pluralist demands largely appear to be answered with primarily singular responses. However, if better ways of implementing collaboration as part of design curricula were more thoroughly researched then perhaps the separatist and possessive mentality of

many of the students surveyed would alleviate and allow for a greater focus on what can be achieved by design, and not the designers who achieved it.

'Technology, ecology, and society are demanding a new breed of designer – holistic, eclectic, emotional, and empowering, these new designers will go into the future, not only as scouts and pioneers, but as leaders who understand contradiction and diversity.'

(Viemeister 2001, pp. 231-232)

The Omnium Project: an online collaborative design (OCD) initiative - www.omnium.edu.au

The Omnium Project (OP) was founded in 1998 in response to perceived 'dislocation' between contemporary design education and design practice. This perception was reinforced by an earlier survey in 1999, of eighty second year Australian design students (Bennett 2001) who identified a series of issues that they felt would improve their design education courses:

- encouragement toward collaboration rather than competition within coursework
- increased awareness of internationalization and cultural diversification
- increased recognition of cross disciplinary approaches to designing
- more contribution from design practitioners and reference to professional industry
- stronger dialogue and interactive components between staff and students
- greater use of new technologies to facilitate design programs
- less prescription and predetermination of set design projects

Whilst forming, Omnium was interested in the emergence and strength of collaborative professional work, especially between practicing graphic and new media designers. However, similar practice within other design disciplines, notably architecture, was also closely observed. Such collaborative approaches to designing appeared to echo views of the surveyed design students in the way they wished to study.

Over a period of six years, The Omnium Project has designed and produced a series of international 'online collaborative design' (Bennett 2003) projects that have formed its conceptual framework. OP began with, and still maintains, two predominant aims - to investigate, analyse and evaluate:

- a revised working approach: exploration into the generation of creative ideas and concepts, collaboratively, digitally and across distance via the Internet.
- a unique technical system: the possibility of applying such a design process within a technical interface that uses *virtual* space for its classrooms or studios: a system that strives to offer an additional option for design education; and how this can be best structured to accommodate contemporary design students' needs.

The issues identified by the students in the 1999 survey (listed above) have continued to be addressed within each Omnium project to date. Perhaps it is no surprise that they also reflect the findings from examining new practices of the design professions *and* the intended revisions in design education (outlined in Part Two of this paper).

The Omnium Project is an ongoing research project that bases most of its online activities within the design discipline of visual communication and graphic design. It should be emphasised that OP strongly encourages cross-disciplinary approaches to designing and many of its participants represent the diversity of the discipline. Design *collectives* such as Antiom⁸, Futurefarmers⁹, AustralianInfront¹⁰ and particularly Tomato¹¹ were heavily influential, both philosophically and physically, in the original formation and structure of Omnium's plans. The importance of awareness and contact with trends in both commercial and educational design practice continue to be deemed crucial to stabilising the 'dislocation' between the two contexts and inturn supports the notion of a 'cycle of support' between the two supposed interdependent fields.

OP has grown considerably in size and reputation since its formation and its structure has undergone considerable design development over the past six years. Linking over 300 people, from over 25 countries, across 5 continents, from design schools within 30 universities and tertiary institutions.¹² The result is a unique framework that includes a collaborative methodology that favours: a conceptual, creative and experimental design content; up to date Internet technology as a context; and a user-friendly software application that allows collaborative interaction to take place between distanced partners (fig 4). The extent to how far OP has progressed in terms of research, design, development, production and implementation of its framework seems unparalleled worldwide. No other research has managed to include 'such participation, scale and ambition of projects; level of reporting; or inclusion of inter-disciplinary design professionals, educators and students' (Gower 1999, 2003).



Figure 4: Screenshots from the Omnium (v3) user-interface. Galleries of collaborative student works and comments to them in the Discussion & Feedback area

⁸ www.antiom.com
⁹ www.futurefarmers.com
¹⁰ www.australianinfront.com.au
¹¹ www.tomato.co.uk
¹² Project titles include:

1999:	Visual Dialogue and Process	(50 participants)
2002 - 2004:	Graphics and Contemporary Society (5)	(160 participants)
2004:	Graphics, Global Communication and Society (2)	(40 participants)
	The Language of Interactivity (2)	(38 participants)
	Collaboration & Visual Communication in Graphic Design	(20 participants)
	Collaboration & Play in Interactive Design	(20 participants)
	Creative Waves	(50 participants)

The Omnium Project's conceptual foundation and structure

In his discussion of design methods, Jones (1991) identifies 'creative collaboration' as the main challenge since the introduction of computerisation in the design process, and that visible collaboration and decision-making processes can provide the main strength in new design methods. He defines designing collaboratively as 'the interaction of what everyone is noticing with what everyone is doing'.

Complementing Jones' argument for collaborative design, The Omnium Project treats online collaboration in visual design practice, first and foremost, as a social interactive process. It maps viable modes of online collaborative design, informed by and interlinked with the principles of visual communication design (e.g. perceptual issues), and the internet and online technology (e.g. behavioral issues), which in turn may provide a new paradigm of online collaboration in visual communication.

The methods for developing Omnium's innovative framework include using qualitative and quantitative methods to evaluate (1) inter-cultural and cross-cultural interaction in the design process for the exchange of information and ideas; (2) tools for synchronous and asynchronous activities and the appropriateness for communication in the design process, (3) textual and graphic methods of communication, (4) interface design, user access and visual function, and (5) anonymity and trust in collaboration.

The natural progression from an individual activity to collaborative ventures, particularly in visual communication and graphic design, has 'created a strong market demand for online technical systems to support such interaction' (Laiserin 2000). Despite widespread implementation and promotion of a variety of online tools for generic interactive communication (particularly for education), no specific software has previously been available to conduct online collaboration in graphic design practice. In addition, 'strong anecdotal concern exists from end-users, regarding usability and appropriateness of the generic online tools when applied to specific contexts' (Brabazon 2002). Omnium has sought to include the observations of Jones, Laiserin and Brabazon; providing a framework that allows an actual collaborative and interactive design process between distanced partners.

Conclusion

Contemporary design 'is not just contingently, but fundamentally, a collaborative, interdisciplinary, geographically distributed and multimedia activity' (Mitchell 1993). It challenges and contradicts the traditional paradigm of design being 'a personal activity, with collaboration more likely to hinder than enhance an individual designer's thought process' (Rand 1993). The established face-to-face design process, seen as 'an individual's reflective dialogue with their work,' (Schön 1985) perhaps no longer seems solely applicable in contemporary design practice and education.

The collective response of over 600 design students (in 1999 and 2003) appears to support this movement towards a greater emphasis on collaborative and cross-disciplinary activity. If a strong 'cycle of support' is to be maintained, to aid of the development of the broader design discipline, then design education must assure the implementation of: *education as a speculative ground for experimentation; the favouring of collective brainstorming and group work; the integration of influential factors from each others*

domain; and, an appreciation and understanding of design across disciplines. By recognising the importance of these factors, the provision of a *life-long learning culture* can be encouraged, for both students and practitioners, within what Warwicker (1999) describes as a rapidly changing world of increased interconnectivity and multiplicity of ideas, cultures and practices.

Although it should be stressed that The Omnium Project is seen as merely an additional option and not a replacement for what already exists, it is taking into consideration a much-required need to *reinterpret* the way design education is practised in contemporary and future society. In effect, The Omnium Project is aiming to meet pluralist demands with a pluralist response – providing a more flexible, holistic and responsive learning culture in a time where increased access to different ideas and abilities characterises the way we live our lives.

REFERENCES

- Bassett, P 1996, 'Design Education: For whom the bell tolls?', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 48-53.
- Brabazon, T. 2002, 'Digital Hemlock: Internet Education and the Poisoning of Teaching', Sydney: UNSW Press.
- Bennett, R. 2003, 'The Omnium Project: Proposing a Framework for Creative Online Interaction'. *Create.Ed 2003 Conference Proceedings*, RMIT Publishing, pp 2-14
- Bennett, R. 2001, 'Omnium: A Research Initiative Proposing Strategies for Quality, Collaborative On-Line Teaching and Learning'. *Education, Communication and Information: Open University (UK) & Harvard (USA) Taylor and Francis/Routledge Press*. Vol 1 No.1. link page 104,
- Biles, A 2002, 'Victorian Values', *Blueprint*, May, pp. 60-6.
- Bryce, M 1996, 'Sleeping with Gropius: and learning to be a designer', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 1-10.
- Burton, M (ed.) 2003, 'Graphic havoc', *Refill Magazine*, Vol. 1, no. 1, pp. 144-9.
- Cami, A 1991, 'On the multidisciplinary myth', *Design*, no. 510, June, p. 5.
- Coker, R 1996, 'The need for consultation process in professional development', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 117-126.
- Danvers, J 2003, 'Towards a radical pedagogy: provisional notes on learning and teaching in art and design', *International Journal of Art and Design Education*, vol. 22, no. 1, pp. 47-57.
- Dean, C 2000, *Graphic Interiors: spaces designed by graphic artists*, Rockport Publishers, Gloucester, Massachusetts.
- Glesta, A 1997, 'Interdisciplinary Art Practice', *Proceedings of the Emergent paradigms in design education: sustainability, collaboration & community conference*, Faculty of the Built Environment, University of New South Wales, Sydney, p. 7.
- Gower, R. 1999 'Om'nium: Virtual Design Studio '99: The World's First Interactive Global Classroom', *Australian Creative*, Spring: p47.
- Gower, R. 2003 'Internet Collaboration: Omnium', *Australian Creative*, February/March: p49.
- Helfand, G 1999, 'All you can eat', in Cahan & Associates (eds), *I am almost always hungry*, Princeton Architectural Press, New York, pp. 136-7.
- Holt, SS. 2000, 'Beauty and the blob: product culture now', in A Albrecht, E Lupton & SS Holt (eds), *Design Culture Now*, King Publishing, in assoc. with the Smithsonian Institution, New York, pp. 21-24.

- Huxtable, P. 1996, 'Amazing design! Pity it's not what the customer wanted', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 36-41.
- Ionescu, L. 2003, 'Michael Spiccia', *Refill Magazine*, Vol. 1, no. 1, pp. 106-111.
- Jones, JC. 1991, 'Designing Designing'. London: Architecture, Design and Technology Press.
- Laiserin, J. 2000, 'The Pre-History of Internet Collaboration', in *Cadence*: December.
- Lupton, E. 2000, 'Fluid Mechanics: typographic culture now', in A Albrecht, E Lupton & SS Holt (eds), *Design Culture Now*, King Publishing, in assoc. with the Smithsonian Institution, New York, pp. 16-20.
- Luekenhausen, H. 1996, 'Plenary session', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 140-141.
- Lupton, E. 2000, 'Fluid Mechanics: typographic culture now', in A Albrecht, E Lupton & SS Holt (eds), *Design Culture Now*, King Publishing, in assoc. with the Smithsonian Institution, New York, pp. 16-20.
- Mitchell, W.J. 'Creative Design in the Computer Era: The Design Studio of the Future'. Viewed 1993
<1993http://sap.mit.edu/dsof/research/creative_design.html>
- Newman, R. 1996, 'Seamless paradigms: A crisis in design education', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 11-25.
- Neumeier. 1999, 'All you can eat', in Cahan & Associates (eds), *I am almost always hungry*, Princeton Architectural Press, New York, p. 9.
- Niederhelman, M. 2001, 'Education through design: A review of the *Re-Inventing Design Education in the University Conference*, Perth, Western Australia, December 11-13, 2000', *Design Issues*, vol. 17, no. 3, Summer, pp. 83-87.
- Poynor, R. 1994, 'Information Sculpture', *eye*, vol. 4, no. 13, Summer, pp. 26-35.
- Rand, P. 1993 'Design, Form and Chaos'. New Haven and London: Yale University.
- Rinzen n.d. *RMX // A visual remix project*, viewed September 2003,
<http://www.rmxxx.com/RMX1/index.html>.
- Seldin, P. 1980, *Successful faculty evaluation programs: a practical guide to improve faculty performance and promotion/tenure decisions*, Coventry Press, New York.
- Schön, D. 1985, 'The Design Studio: An Exploration of its Traditions and Potential', London: RIBA Publications LTD.
- Stephens, H. 1996, 'Design for the real person', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 42-47.
- Swann, C. 1996, 'Life after graduation – do Australian designers continue to develop?', *DIA National Conference on Design Education Proceedings*, Design Institute of Australia, Hawthorn, Victoria, pp. 26-33.
- Szenasy, S. (ed.) August/September 2003a, 'Class notes: Tschumi and Mori on the Education of Architects', *metropolismag.com*, viewed 4 September 2003, <http://www.metropolismag.com/html/content/0803/mor/index.c.html>.
- Thompson, PW. 2003, 'Preface', in E Lupton, D Albrecht, S Yelavich & M Owens (eds), *Inside design now*, Princeton Architectural Press, in assoc. with the Smithsonian Institution, New York, p. 17.
- Viemeister, T 2001, 'What's after world domination?', in DK Holland (ed) *Design Issues: How Graphic Design Informs Society*, Allworth Press, New York, pp. 227-232.
- Warwicker, J. 1999, 'A virtual city in a global square', *eye*, vol. 9, no. 34, Winter, pp. 38-44.
- Webb, M. 1997, 'An established experiment', *Metropolis*, October, pp. 92-96, 111.
- Wild, L. 1996, 'That was then, and this is now: but what is next?', *Émigré*, no. 39, Summer (Republished in: Bierut, M, Drenttel, W & Heller, S 2002, *Looking closer 4: critical writings on graphic design*, Allworth Press, in assoc. with the American Institute of Graphic Arts, New York, pp. 136-150).

Weisman, LK. 1997, 'Redesigning architectural education and practice: visions for the 21st century', *Proceedings of the Emergent paradigms in design education: sustainability, collaboration & community conference*, Faculty of the Built Environment, University of New South Wales, Sydney, pp. 53-9.

Wojtowicz, J. (ed.) 1995, *Virtual Design Studio*, Hong Kong University Press, Hong Kong.